

A

PROBATIONARY ESSAY

ON

PHLEBITIS,

SUBMITTED,

BY AUTHORITY OF THE PRESIDENT AND HIS COUNCIL,

TO THE EXAMINATION OF

The Royal College of Surgeons of Edinburgh,

WHEN CANDIDATE FOR ADMISSION INTO THEIR BODY,

IN CONFORMITY TO THEIR REGULATIONS RESPECTING
THE ADMISSION OF ORDINARY FELLOWS.

BY

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TO


JAMES HUNTER OF THURSTON, Esq., F.R.S.E.

THIS ESSAY

IS MOST AFFECTIONATELY DEDICATED

BY HIS NEPHEW,

THE AUTHOR.



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TO

DAVID HAY, Esq., M.D.

FORMERLY PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS,

&c. &c. &c.

THIS ESSAY

IS ALSO INSCRIBED,

AS A TOKEN OF GRATITUDE AND ESTEEM,

BY

THE AUTHOR.

ON PHLEBITIS.

INTRODUCTION.

THE subject of the following paper was suggested by my having seen several cases of the disease during my attendance at the Royal Infirmary, both as student and clerk. Of some of these I took notes at the time of their occurrence, others I got from the journals of cases, and through the kindness of the managers have been permitted to insert them in the Statistical Table at the end of the paper. With a view to the avoiding of repetitions, and to the simplification of the subject, I propose treating of it under the following heads : viz.

1. Some General Remarks upon the Disease.
2. The Symptoms.
3. The Causes.
4. The Seats.
5. The Pathology.
6. The Diagnosis.

7. The Termination.
8. The Prognosis.
9. The Treatment.

As this affection is not one of very common occurrence, I have not been able to procure so many cases for the Statistical Table as I could have wished. I hope, however, that the average may be sufficient to draw conclusions from relative to the disease.

PHLEBITIS (from φλέψ-φλεβός a vein) appears to have been unknown to the older physicians. Aretæus of Cappadocia and Hildanus have both described inflammation of the blood-vessels; they were not aware, however, that the alarming symptoms frequently presented by this disease, depended upon inflammation of the coats of the veins, they therefore referred them to other causes. Thus, *Hildanus mentions two decided cases—one following venesection in fever in which the arm swelled prodigiously, an abscess formed in the vein and burst, gangrene came on in the arm, and amputation was had recourse to with success; the symptoms in this case he refers to injury of the tendon of the biceps, although he admits that foetid pus escaped from the Basilic vein after the removal of the arm.

* See Fabricius Hildanus, p. 342.

Others supposed that the symptoms depended upon the injury of a nerve or aponeurosis, or upon a bad constitution. These theories were disproved by John Hunter,* who observed, that the wounds in the veins of horses very frequently suppurate and cause very troublesome sores, accompanied with the same alarming symptoms which occur in some cases in the human subject. He carefully examined the bodies of these horses, and found that the morbid lesions were chiefly confined to the veins; by comparing these facts with some which he had observed in practice, and by carefully examining the bodies of patients who died with these alarming symptoms, he discovered that the veins were almost always the seat of the disease.

Since the year 1784, when Hunter made his discoveries, much valuable information has been published regarding this disease. The following are the best authorities: Abernethy, Hodgson, Breschet, Cooper, Dance, Arnott, Lee, Rose, Carmichael, Ribes, and Le Herissé.

* Transactions of a Society for promoting Medical and Surgical Knowledge, vol. i. p. 18.

THE SYMPTOMS.

These may be divided into three orders,* viz.—

1st, Local symptoms, without fever.

2d, General symptoms joined to the preceding, and in proportion to the extent and intensity of the venous inflammation.

3d, More severe symptoms, indicating the circulation along with the blood, either of pus or of some irritant fluid, and developing various complications. These orders of symptoms may be observed in most cases following venesection, varying, of course, according to the size and situation of the vessel, and the extent of the injury.

The local symptoms usually commence with tension and stiffness of the limb, accompanied by pain extending along the course of the vein, sometimes also by redness and increased sensibility. If the Phlebitis be the consequence of venesection, the pain is often overlooked at first, until an exudation of serum or pus takes place from the wound. The disease is more easily detected, when it occurs in a superficial than in a deep-seated vein, as the redness and swelling are usually greater, and frequently the limb presents red, hard, elevated, and painful lines along the course of the vein. This inflammation

* Archives Generales, (Dance,) vol. xix. p. 181.

usually follows the course of the blood; in some cases, however, it extends in a contrary direction from the wound, and in others it attacks several parts of the same vein, presenting erysipelatous spots along its tract, which soon unite so as to form a general erysipelas of the limb, accompanied with pain, tension, and discoloration, which are most marked along the course of the vein. This form of the disease usually follows phlebotomy.

If, however, the disease follows a puncture with a sharp foul instrument, or inoculation on an excoriation or ulcer, then it has its seat almost invariably in the deep veins of the extremity. The chief local symptoms of this form of the disease are hardness, stiffness, and tension, with difficulty of motion, and increased sensibility of the limb. The constitutional symptoms commence with rigors, pain of head, inexpressible uneasiness, and sometimes with nausea and vomiting. The patient becomes agitated, restless, and sleepless, the pulse is hard, strong, and frequent; sometimes, however, it is small and intermittent; the face is flushed, the skin hot, the pain and weight in the head increase, there is much irritability, with delirium; the breathing becomes difficult, the tongue is dry, and the gums and teeth covered with sordes, and drowsiness and delirium usually precede death. These severe constitutional symptoms usually occur when the inflammation has ex-

tended into some of the larger venous trunks, or when pus or lymph is secreted into their cavities, and bear a close analogy to those of typhus fever.* When the venous inflammation is not very extensive, its symptoms resemble those of local inflammation in general. In some cases, the symptoms of the disease are very obscure, resembling gastro enteritis, hepatitis, arachnitis, pneumonia, carditis, or typhus. Sometimes the pain is very acute, and is referred to the joints, hence the disease may be confounded with rheumatism or gout. The articulations, however, are neither red nor swelled, but very tender on pressure.† Phlebitis resembles diffuse inflammation in other organs ; it resembles inflammation of the absorbents, in its disposition to continuous inflammation ; hence the diseases have been frequently confounded.

The best description of the two latter orders of symptoms is that given by Mr Arnott.‡

The secondary affection in Phlebitis usually shows itself in from two to ten or twelve days after the receipt of the injury which has occasioned the inflammation in the vein, and when the vessel has been previously diseased, it sometimes commences

* Hodgson on Diseases of Arteries and Veins, p. 513.

† Dictionnaire de Medicine, Breschet.

‡ Medico Chirurgical Transactions, vol. xv. p. 51.

sooner. The symptoms may be thus briefly characterized :—

“ Great restlessness and anxiety, prostration of strength and depression of spirits, sense of weight at the præcordia, frequent sighing or rather moaning, with paroxysms of oppressed and hurried breathing, the patient at the same time being unable to refer his sufferings to any specific source. The common symptoms of fever are present, the pulse is rapid, reaching sometimes to 130 or 140 in a minute, but is in other respects exceedingly variable. There are often sickness and violent vomiting, especially of bilious matter, frequent and severe rigors almost invariably occur, sometimes to the number of three or four in the course of a few hours. The general irritability and deep anxiety of countenance increase, the manner is quick, and the look occasionally wild and distracted. When left to himself, the patient is apt to mutter incoherently, but, on being directly addressed, is found clear and collected, the features are pinched, and the skin of the whole body becomes of a sallow, or even deep yellow colour. Under symptoms of increasing debility, and at a time when the local affection may appear to be in a great degree subsiding, secondary inflammation of a violent character, and quickly terminating in effusion of pus or lymph, very frequently takes place in situations remote

from the original injury ; the cellular substance, the joints, and the eye, have been affected, but it is more particularly under a rapidly developed attack of inflammation of the viscera of the chest that the fatal issue usually occurs. Whether this is observed or not, death is always preceded by symptoms of extreme exhaustion, such as those of a rapid feeble pulse, dry brown or black tongue, teeth and lips covered with sordes, haggard countenance, low delirium," &c.

The first symptoms of Traumatic Phlebitis of the arm are in general so slight as to attract but little attention ; they commence with pain in the wound, or mere stiffness about the joint, the edges of the incision become very red, fester, and form a thin crust, which is washed away by a slight red-coloured serous or puriform discharge, the course of the vein becomes hard, painful, and knotty, like a cord, and redness, swelling, and stiffness, take place in the soft parts covering the vein. Sometimes the inner surface of the arm, or the whole limb, becomes tense, swollen, red, and painful, as in Erysipelatous inflammation of the parts. The skin and contiguous parts also suffer, as well as the coats of the vein. The severity and extent of the disease vary, of course, in different cases. It is sometimes of an adhesive character, producing merely thickening and obliteration of the vein ; at other times, of a

diffusive and suppurative, when it is attended with severe constitutional disturbance, terminating in death, whatever plan of treatment be adopted.*

There is a peculiar form of the disease which differs somewhat in its symptoms from the preceding, and which will require a separate description. I refer to Uterine Phlebitis, commonly known under the name of Phlegmasia Dolens, so called from painful swelling of the limbs being one of its chief symptoms.

It is but lately that the true Pathology of this disease has been discovered. The early writers upon it started theories of their own to account for the extraordinary symptoms ; and these, with various modifications, suited to the fancies of the different authors who have received and supported them, have enjoyed a brilliant reputation in the Continental schools of medicine.

Mauriceau imputed the disease to metastasis of the lochia ; Mesnard to suppression of the lochia, producing an over-fulness in the blood-vessels, and a consequent arrest and coagulation of lymph in the parts affected. Another theory, advanced by Puzos and supported by Levret, is, that it is caused by a metastasis of the milk. Mr Charles White supposed that it depended upon obstructions, or rather

morbid states, of the lymphatic organs of the part affected; and Dr Hull's theory, which is the most comprehensive of all, is, that the disease consists of an inflammatory affection, producing suddenly a considerable effusion of serum and coagulating lymph from the exhalants into the cellular membrane of the limb, the inflammation being seated in the muscles, cellular membrane, and inferior surface of the cutis; in some cases the inflammation being communicated to the larger blood-vessels, nerves, lymphatics, and glands.

The objection to all these theories is, that they are not supported by facts and observations. Dr Davis, however, has proposed a theory which is well supported by *post mortem* examinations. It is the following,* viz. :—

“That the proximate cause of the disease called Phlegmasia dolens is a violent inflammation of one or more of the principal veins within, and in the immediate neighbourhood of the pelvis, producing an increased thickness of their coats, the formation of false membranes on their internal surface, a gradual coagulation of their contents, and occasionally a destructive suppuration of their whole texture; in consequence of which, the diameters of the cavities of these important vessels become so greatly di-

* London Medico Chirurgical Society's Transactions, vol. xii. p. 426.

minated, sometimes so totally obstructed, as to be rendered mechanically incompetent to carry forward into their corresponding trunks the venous blood brought to them by their inferior contributory branches.”

The symptoms of this form of the disease commence with stiffness or soreness in one of the lateral regions of the lower belly, and pain in moving or turning about the body; a fulness and hardness, and, for the most part, a circumscribed tumor, may be perceived in the affected iliac region; there is weakness, usually followed by œdema of the thigh and leg of the same side, which in general supervene on the second or third day after the coming on of the pain of the flank.* In some cases, the first pain, and that which is most complained of, is in the calf of the leg. If pressure be applied to the groin, however, the patient will in general wince greatly. The swelling which succeeds the pain is first perceived in the groin and adjacent parts, and gradually proceeds downwards from the pelvis to the toes. When the disease follows delivery, these symptoms usually commence on the tenth or twelfth day; and, if the abdomen be examined about this time, the uterus will be felt enlarged, and forming a hard tumor above the pubes, accompanied with a sense

* Trye's Essay on Phlegmasia Dolens.

of weight and fulness in the belly, which is painful on pressure ; the uterus feels enlarged by the vagina, its neck is hard and open, the urine is hot, and passed with difficulty ; there is no lochial discharge, but sometimes a purulent foetid one ; delirium and uneasiness, with many of the general symptoms of Phlebitis, supervene ; the expression of the countenance is changed, the pulse becomes feeble and compressible, the breathing laborious, and death is ushered in by weakness, prostration, and delirium.

For a long time, it was supposed that Phlegmasia Dolens was a disease peculiar to child-bearing ; however, of late, several well authenticated cases have been met with in the male, caused, in general, by affections of some of the large pelvic veins.

For the two accompanying cases, I am indebted to the kindness of Dr Hay, in whose practice they occurred. The first was that of a gentleman nearly sixty years of age, who, in the summer of 1832, was attacked with pain of the loins resembling Lumbago, and accompanied with febrile symptoms. The pain extended to the upper part of both thighs, where the femoral veins were felt extremely full, tense, and painful on pressure ; the veins in the lower part of the limbs were congested. These symptoms were gradually relieved by the employment of cupping over the loins, purgatives, and the horizontal

posture, and now there remains only a thickening about the ankles, and a greater distension of the superficial veins than formerly existed. The attack was ascribed to cold and fatigue.

The second case was that of a young man of twenty-two, who had passed through an attack of continued fever, and appeared to have relapsed about the 30th day. He complained of pain at the top of the left thigh, where the femoral vein was found swollen, and painful on pressure. The employment of leeches, saturnine lotions, and purgatives, relieved him; the leg was also bandaged from the ankle upwards, on account of the œdema which supervened. Now, two years since the attack, the veins at the ankle are considerably more enlarged than those of the opposite limb. For a few cases of this kind, following continued fever, see Mr Sidey's paper in the *Edinburgh Medical and Surgical Journal* for 1828.

THE CAUSES OF PHLEBITIS.

Mr J. Hunter observed that the veins of horses were very frequently attacked with inflammation after the operation of bleeding; this he very naturally supposes is produced by the method of operation and subsequent treatment. The wound is, in most cases, a lacerated and contused one, and has

a pin left remaining in it. Now it has been proved by experiments, both on animals and on the living subject, that if veins be compressed by a ligature, or merely by external pressure, if their coats be transfixed by a pin, needle, or any foreign body which remains in the wound, or even if the lips of the wound do not unite, a certain amount of inflammation almost invariably ensues ; and this differs from inflammation in arteries, in being much less under the control of remedies, in being very liable to continuous, and but little to adhesive inflammation, and in most cases, being accompanied by very severe constitutional disturbance.

Veins are liable to the same morbid changes as other parts of the body, the internal coat is most frequently found affected on dissection. The disease sometimes occurs spontaneously in some of the deep-seated veins of the trunk and extremities. The cases, however, are few in which it cannot be referred to a wound, or to some specific cause applied to the coats of the vessels. By far the most frequent cause of the disease is the operation of Phlebotomy, the arm of the patient being neglected after it. If the wound be prevented from healing by the first intention by the restlessness or incaution of the patient, or from the operation being frequently repeated in the same vein, a certain amount of the disease always follows.

The most common causes of Phlebitis, says Dance,* are lesions acting on the internal coats of veins. These are of two kinds, viz. those that alter directly the tissue, as the continued application of heat or cold to a limb, pricks or punctures, cuts or excisions for the cure of varix, ligatures in amputation, for the cure of varix, or upon the umbilical cord of children, simple pressure, or the long-continued pressure of a tumor, distension, contusion, or tearing of veins. The second class of causes are those that act by allowing the contact of acrid and irritating matters on the inner surface of the vein; such are punctures with a foul instrument, or a lancet which has been used for vaccination, or from inoculation under the skin, or into the veins of a putrid, poisonous, or irritant matter; more especially from punctures in the dissection of peritonitic patients, also absorption from ulcerated, excoriated, or blistered surfaces, cancers of rectum, and uterus, gangrenous surfaces, and suppurations after amputations and wounds.

The causes of Uterine Phlebitis are pressure on the veins of the uterus during parturition, the exposure of the cavities of some of the larger ones by the separation of the placenta and uterus, and the extremities of these coming in contact with an inflamed surface, and the lochial discharge, decom-

* Archives Generales, vol. xix. p. 17.

posed clots, or putrid portions of placenta entering them, and being carried into the circulation.

Broussais states that the veins are often inflamed in measles, small-pox, and scarlatina ;—some also suppose that *Purpura hæmorrhagica* depends upon inflammation of the veins.

Ribes supposes that *Erysipelas* is seated in the extremities of the veins, and Bouillaud has referred the phenomena of Typhus fever to *Phlebitis*.* These theories, however, are merely fanciful, as they do not appear to be supported by observations.

Phlebitis has been seen to follow *Hernia*, *Fistula*, and *Cancer of Rectum*, and the ligature of a *Uterine Polypus*.†

The ancients, in their operations, pricked, cut, tied, and burnt veins, without regard to any other than the mechanical effects of such operations ; and some old surgeons still tie veins after amputations, in many cases without producing any serious effects. Some Continental surgeons, I believe, still keep up the practice. Having witnessed three cases, however, which, upon dissection, proved fatal from this cause, (viz. one in which a large vein was accidentally wounded, and a ligature put upon it, which was followed by very severe constitutional symptoms and death ; and two in which ligatures were put upon veins in amputation, and where, after death, these

* *Cyclopedia of Practical Medicine.*

† M. Blandin.

vessels were found very much inflamed, and their cavities filled with pus,) and having read and heard of many others, I feel confident that, although some surgeons adopt this practice with apparent success, still it is one which is attended with much danger to the patient, and which, in this country, brings discredit upon the surgeon.

M. Cruveilhier states, that Phlebitis of bones is one of the most frequent causes of visceral abscess, the consequence of wounds and operations in which the bones are interested. In some cases recorded by him there was found suppuration of the medullary membrane, sometimes through the whole length of the bone ; he also states, that operations on bones are very liable to produce the disease ; and, however extensive this may be, if the pus does not enter the circulation, no accident follows ; but as soon as the impediment, formed by the coagula, is removed, atonic adynamic fever, preceded by intense shivering, takes place, and is soon followed by death.

THE SEATS.

By far the most frequent seat of Phlebitis is in the superficial veins at the bend of the arm ; it also occurs, though by no means so frequently, in the deep-seated veins of the arm, in the saphena, uterine,

external and internal iliacs, and their branches, the femoral, and tibial, the vena cava, splenic, renal, azygos, vena portæ, and veins of the intestines. The iliac, spermatic, vesical, uterine, and vaginal veins are often found inflamed, their coats thickened, and their cavities obliterated, by lymph or plugs of coagula in women, who have died shortly after parturition, with symptoms of puerperal peritonitis, or phlegmasia dolens.

The disease has also been found in the pulmonary veins, the innominata, and jugulars, the veins of the eye, the sinuses of the brain, and the veins returning blood from the larger bones of the body. Infants are also frequently attacked with Phlebitis, from the tying of the umbilical cord.

THE PATHOLOGY.

Veins are subject to inflammation in like manner as the other tissues of the body.

J. Hunter remarks,* that in violent inflammations of the cellular membrane, whether spontaneous, or in consequence of an accident, the coats of the larger veins passing through the affected part soon become diseased, and their inner membrane takes

* Transactions of a Society for Improving Medical and Surgical Knowledge.

on the suppurative, adhesive, or ulcerative inflammations. In such cases, abscesses would soon be formed, were it not for the effused fluid entering the circulation. When this fluid consists of pus, it becomes mixed with the circulating blood, and has of late been proved, by physiologists,* to excite but little constitutional disturbance, even although the quantity of pus be very considerable; thus overthrowing the opinion of Hunter and the early writers on this subject, who supposed that the violence of the symptoms depended upon the circulation through the heart of this fluid, mixed with blood. As an additional argument against this theory, it has been ascertained by dissection, that the most rapidly fatal cases of this disease are those in which no pus is effused, but in which effusion of lymph and adhesive inflammation occur. In cases in which the inflammation has continued for a length of time, and has been very violent in degree, the vein will be found proportionably inflamed; there also, after suppuration has occurred, will the purest pus be found, and if the vessels be traced from the affected part, either farther from or nearer to the heart, the pus will be found more and more mixed with blood.

In some cases of Phlebitis, abscesses form along the course of the affected vein, usually between the wound or seat of the inflammation and the heart, and

* Gaspard and Gulliver.

in such cases the disease sometimes terminates favourably by the obliteration of the vein, and the healing up of those abscesses.

Phlebitis, when caused by a wound, usually extends along the internal surface of the vessel to some principal venous trunk ; in some cases towards the heart, in others in a contrary direction, and in a few instances in both directions. The extent of vein inflamed varies very much, being sometimes merely an inch, and at other times several feet in length. Hunter supposed that the inflammation extended in some cases even to the membrane which lines the interior of the heart, and that it caused death in this way. There are no cases on record, however, as far as I am aware, in which this appearance has been discovered upon dissection. This theory, then, as theory it must be called, since it is not supported by facts, must have been proposed to account for the violence of the symptoms.

When a vein is inflamed, its coats become gradually thick and vascular, and the inner membrane is coated with lymph or pus ; its cavity, in some cases, becomes obstructed by coagula, by lymph, or by plugs of fibrine ; and if this obstruction be permanent, the coats are gradually converted into a ligamentous cord, and circulation is carried on by some of the collateral branches—a cure being thus effected.

Pathologists are by no means agreed as to the cause of death in this disease. Some maintain that it is caused by the extension of the inflammation to the heart or membranes of the brain; others that it is caused by the conveyance of pus into the circulation.

Mr Arnott thinks that he explains the phenomena very satisfactorily, by reminding us of the importance of the veins in the economy, of the great extent of their surface, and of the diffuse and disorganizing character of the inflammation to which they are subject; and he winds up by saying, "That all the mystery of veins is, that they are indisposed to inflame, except when excited to inflame by continuity, and therefore it is that the constitution sympathises so deeply."

Dr Lee thinks it most probable, that death is caused by the circulation of a poison through the system, as the symptoms resemble those produced by the injection or inoculation of acrid or poisonous fluids into the veins.

The chief error committed by these pathologists seems to me to be their attempts to refer death in all the cases to the same cause, and not allowing for difference in the seats, causes, and symptoms of the disease, or in the constitution or previous state of the patient. The two latter theories appear to be the most plausible. Doubtless cases might be brought

forward to support the others also ; but if these be taken collectively, they will most probably show that death may depend upon causes, varying according to the circumstances of each case. Thus, it would be absurd to maintain, that, in the cases in which only a small portion of the vein is found inflamed on dissection, death was caused by the diffuse or disorganizing nature of the inflammation. It would also be equally absurd to maintain that, in the most rapid cases of adhesive inflammation, death depended upon the circulation of pus in the blood.

THE DIAGNOSIS

in this disease is by no means so easy or certain as might be expected ; because, although the disease attacks a particular tissue, still the functions of the other organs become deranged as the circulation is affected.

In cases where the Phlebitis is superficial, and the consequence of venesection, it may be distinguished from inflammation of the lymphatics, by the phlegmatia being less intense, and more superficial, and by the inflamed vessels showing themselves exteriorly, by two or three red straight lines, which are neither particularly tense nor unequally knotted cords, and by the lymphatic glands running

quickly on to inflammation, tension, and suppuration. Phlebitis may be distinguished from inflammation in a nerve, by the pain in the latter being sometimes transient, and, if caused by an injury, by its being felt immediately on the reception of this, whether it be a puncture, a bruise, or a partial division; besides, the pain in a nerve, whatever be the cause of it, extends along the superior or inferior surface of the extremity, terminating in the fingers or toes.* The Diagnosis in Uterine Phlebitis is also difficult, from the similarity of its symptoms to those of inflammation of the substance of the uterus. This is not of much consequence, however, as the treatment is alike in both diseases. It may be distinguished from Peritonitis by the swelling of the legs, by the pain being most severe at the lower part of the pelvis, by the want of tympanitis, and of acute tenderness over the whole surface of the abdomen.

THE TERMINATION

of inflammation, when seated in the veins of the extremities, may be in resolution, if the irritation has been slight, and if treatment has been early

• Dictionnaire de Medicine, t. xvi.

resorted to ; or the disease may terminate by adhesion of the parietes of the affected vein, which becomes obliterated, and assumes the appearance of a ligamentous cord. This only occurs, however, when the inflammation has been comparatively slight, and the irritation local ; and, in mild cases, may sometimes be artificially produced by exercising gentle compression over the whole limb, by bandaging, and applying cooling lotions.

Suppuration is a pretty frequent termination of Phlebitis, and is accompanied with very various symptoms, being sometimes scarcely perceptible during the life of the patient ; and at other times giving rise to great constitutional disturbance. Thus, in the case of obliteration of the inferior vena cava,* where $\frac{3}{4}$ iv. of pus were contained in it, there do not appear to have been any very decided symptoms taken notice of ; while in many cases, where pus is discharged from the wound in a vein after phlebotomy, or where the pus from a bad ulcer or gangrene enters the circulation, great constitutional disturbance ensues.

In some cases the disease terminates in ulceration, as has been shown by Morgagni, Portal, Hodgson, and Travers. In most cases obliteration precedes the ulceration, and thus prevents hæmor-

* Transactions of a Society for Improving Medicine and Surgery. vol. iii. p. 65.

rhage ; or if there be a flow of blood, it is usually caused by the ulceration extending from the surface to the interior of the vessel, before the obliteration by adhesive inflammation can occur. It is doubted whether inflammation of veins may ever terminate in gangrene. The French pathologists allow it to be possible, although it has never been observed. However, when gangrene, sphacelus, or hospital gangrene, attack any part or organ of the body, the veins are destroyed along with the other tissues, showing that they take on this action.

Ossification is but a rare termination, and occurs only in old varicose veins, as the saphena, and veins of the spermatic cord. It has also been met with in some of the pelvic veins.*

When sphacelation occurs near a vein, its cavity, like that of an artery under similar circumstances, becomes filled with extensive coagula, which prevent hæmorrhage on the separation of the mortified part.

The terminations of Uterine Phlebitis are much the same as those of Phlebitis in general, with this exception, that the inflammation usually extends into the substance of the uterus, and to most of the neighbouring viscera. Thus James remarks:†—
“ It would seem that in a very large number of

* Dictionn. de Medicine.

† James on Inflammation, p. 460.

cases of acute disease consequent on parturition, which has commonly been designated by the name of Puerperal Fever, inflammation of veins is present ; at least, out of 222 victims of this disease, in the years 1828 and 1829, at the Hospice de la Maternité, 132 had inflammation of the pelvic veins, and in most of these the inflammation was not confined to the veins.”

It has been recently proved,* that inflammation of the veins is generally the cause of those abscesses or deposits of pus, which take place in the lungs, liver, spleen, kidneys, joints, cellular membrane, &c., after operations and injuries, especially of the head, also after parturition ; but whether these are the consequences of local inflammation, or are produced by metastasis, has not been satisfactorily proved.

Dance remarks that they occur only on the side of the body corresponding to the vein inflamed. This, however, is not uniformly the case.

THE PROGNOSIS

must always be very guarded, as it will be materially affected by circumstances, viz., the situation of

* By Arnott and Dance.

the disease, its cause, duration, and complication, the previous state of health, or particular constitution of the patient. Thus, many cases of the disease run their course with a rapidity which seems to be quite inexplicable, and which must depend upon some peculiar state of the constitution; but what this is has not yet been determined, as cases of this kind occur amongst the robust and plethoric, as well as in persons who have been weakened by disease or intemperance. It appears to be most severe and rapid in its course in those whose constitutions are impaired by dissipation.

The danger will always be in proportion to the development of the disease and the magnitude of the affected vessel, or as it affects an organ more or less important to life. When it occurs in the superficial veins of the extremities, and when produced by an external cause, and without the inoculation of a morbid principle, it is commonly less severe, and is in most cases confined to the vein which has been injured, and to the surrounding cellular tissue. The danger in this disease is apparently less from the venous inflammation than from the vitiation in the blood following it; hence the prognosis will be unfavourable, unless the disease be early treated, or symptoms of secondary suppuration have occurred. The prognosis will be little affected by the age or sex of the patient, as severe

cases occur at all ages, from 14 to 76, according to the statistical table.

THE TREATMENT

in Phlebitis comprises two heads, viz. the preventive and curative.

The disease following venesection will be best avoided by abstaining from frequent bleedings in the same vein, or in the same part of a vein. After the operation, care should be taken in dressing the wound to bring the edges into contact, and thus to prevent any foreign body from getting between them, which may impede the progress of adhesion by the first intention.

The bandage should be lightly applied over the wound, that the veins may not be over distended. The veins in or near to an inflamed part should never be opened, as they are then predisposed to take on the same action. The lancets used in phlebotomy should not be the same as those for other purposes, as opening abscesses, or vaccinating, as they frequently retain the matter of these for a length of time. If the wound in the vein be ascertained to be foul, it should be washed, then sucked, so as to make it bleed, or an exhausted bell-glass may be applied over it for the same purpose, by

which means absorption will be best prevented ; after this the part may be cauterised with a mineral acid, or nitrate of silver. In cases of puncture with inoculation, Mr Barry recommends the employment of watery lotions, with suction.

Immersion of the limb in cold or iced water, or the application of lint dipped in these, have been recommended at the commencement of the inflammation, or when it is merely local. When the disease becomes developed, or extends, the treatment must be more active, and should consist of blood-letting, both local and general, accompanied with emollient applications. In some cases of this kind the solution of acetate of lead is found to be very beneficial, either alone, or combined with opiates or narcotics. In mild cases, gentle regulated pressure is also good when applied to the whole of the limb, and frequently affords relief to the sufferings of the patient. Some cases have been cured by the application of compresses along the whole course of the affected vein, and others by laying open the vein through the whole extent of the inflammation. This is an old and dangerous practice, however, and, from the number of fatal cases of this kind, the practice has been justly abandoned. If the inflammation be kept up by an irritable ulcer or sore, this should first be attended to.

The general symptoms ought to be treated in the same manner as those of Phlegmatia. Some cases of the disease, however, resist all modes of treatment, and go on to affections of head, lungs, heart, liver, intestines, joints, spinal marrow, &c. If the inflammation be confined to the punctured vein, the treatment should be the same as that of local inflammation in general, viz., leeching, cooling or anodyne applications, with the internal employment of purgatives, refrigerants, and low diet. In mild cases, Mr Hunter recommends the employment of gentle pressure above the wounded part, so as to bring the opposite sides of the vessel into contact, and thus prevent the extension of the inflammation. Observation, however, has proved that this is not always successful in arresting the progress of the inflammation. A slight degree of Phlebitis is sometimes artificially induced, in order to effect a cure in some diseases. Thus, Mr Travers cured some cases of varix in the saphena, by the application of strips of adhesive plaster over the vessel. Mayo, and some others, used caustic, the knife, and needles, for the same purpose. The inflammation thus induced, however, sometimes spreads to a great degree, and occasionally proves fatal.

When the disease was first observed, powerful local antiphlogistic remedies were had recourse to ;

as also, in some cases, internal stimulants. Cases treated by the latter means, however, almost uniformly proved fatal.

In mild cases, care must be taken to support and give rest to the limb, and leeches may be freely applied to the course of the inflamed vessel. This may be followed by an emollient, or saturnine poultice, by an evaporating lotion, or by the *lotio acetatis plumbi cum opio*, cooling saline purgatives, and diaphoretics, may be administered internally.

The General Treatment, says Mr James,* cannot be too decidedly antiphlogistic. When, from the continuance of the disease, or the other symptoms, secondary inflammation may be suspected, this mode of treatment is more questionable, and its results often unfavourable.

General blood-letting is a good remedy, in most cases, but opinions differ considerably with regard to the employment of it. Mr Sanson recommends the tartrate of antimony in pretty large doses.

In the advanced stages of the disease, when the general symptoms indicate depression, wine, ammonia, quinine, and camphor, are requisite.

In Uterine Phlebitis, the treatment should be prophylactic, as it is much more easy to prevent than to

* On Inflammation.

cure the disease. The patient ought to be very careful for at least nine days after delivery, and should avoid exposure to fatigue, cold, and wet, and should abstain from stimulant food or drinks. Emollient injections may be thrown up into the uterus, so as to wash away any clots of blood or portions of placenta which may be left. Antiphlogistic remedies must also be had recourse to in the early stages, and of these, general blood-letting is preferable to the employment of leeches. In the latter stages of the disease, tonics and antiseptics may be had recourse to ; in other respects, the treatment of Uterine Phlebitis may be the same as that of Phlebitis in other parts of the body.

FINIS.

A STATISTICAL TABLE OF CASES OF PHLEBITIS.

NAME.	AGE.	SEX.	CAUSE OF DISEASE.	SEAT.	TIME OF INVASION.	DURATION AND TERMINATION.	MORBID APPEARANCES IN THE VEINS.	MORBID APPEARANCES IN OTHER ORGANS.	REFERENCES OF CASES.
Hugh Johnson,	33	m.	{ Bled for ophthalmia, } of a bad constitution,	median basilic,	on 9th day,	fatal on 13th,	{ Enlarged, and containing pus up to Axilla, also lymph, - - - }	{ Serous effusion in pleura and peri- cardium, - - - - - }	Cooper's Surgical Essays.
A soldier,	36	m.	Bled for ophthalmia,	cephalic,	2d,	fatal in 7th week,	{ Thickened and obliterated up to shoulder, pus and lymph in exter- nal Jugular and Subclavian veins, }	{ Abscesses in lungs, serum and lymph in pleura, and serum in ventricles of brain, - - - - - }	Hodgson on Diseases of Art. &c. p. 389.
George Williamson,	14	m.	Bled for fever, -	median basilic,	3d,	fatal on 6th,	Containing pus, - - - -	- - - - -	Infirmiry Journal.
Henry Syme,	30	m.	Bled for fever, -	median basilic,	3d,	fatal on 4th,	Containing pus, - - - -	- - - - -	Infirmiry Journal.
Gregor Drummond,	25	m.	Bled for dropsy, -	median basilic,	5th,	fatal on 19th,	Obliterated, - - - -	{ 3iv. of serum with lymph in pericar- dium, great effusion of serum into the thorax and abdomen, - }	Infirmiry Journal.
John Bolt,	52	m.	Bled for bronchitis,	median basilic,	5th,	fatal on 22d,	Thickened, but not containing pus,	Serum in pleura, pericard., & ventricles,	Infirmiry Journal.
Michael Dogherty,	31	m.	Bled for fever, -	r. med. basilic,	3d,	fatal on 30th,	{ Thick like an artery, and filled with coagulable lymph and pus, }	{ Purulent deposit at left wrist, and lymph on left side of heart, }	Med. Chirur. Trans. vol. 15.
Elizabeth Harper,	34	f.	Bled for hepatic affection,	median basilic,	3d,	recovered,	Abscesses formed in course of vein,	- - - - -	Med. Chirur. Trans. vol. 15.
Jane Robertson,	19	f.	Bled for fever, -	median basilic,	7th,	recovered,	Vein discharged pus for 16 days,	Abscesses formed in Axilla and Biceps,	Med. Chirur. Trans. vol. 15.
Mary Stewart,	60	f.	Bled for pulmonic affect.	median basilic,	2d,	recovered,	Abscess formed in the vein,	- - - - -	Med. Chirur. Trans. vol. 15.
- Gredig,	22	m.	Bled for pectoral affect.	median basilic,	6th,	fatal on 17th,	Contained pus and almost obliterated,	{ Subarachnoid effusion, optic thalamus and right corpus striatum softened, mucous coat of stomach softened, - - - - }	Archives Gen. de Med. vol. 20.
- - -	24	f.	Bled for pectoral affect.	median basilic,	2d,	recovered,	{ Wound discharged pus for 9 days, vein obliterated, - - - }	An abscess formed in fore-arm, -	Archives, vol. 19, p. 48.
A coachman,	20	m.	Bled for pneumonia,	median basilic,	3d,	fatal on 12th,	{ Enlarged, containing pus inclosed in a false membrane, and coagula up to Axilla, - - - }	{ Pus in shoulder joints, abscess in neck, pleuritic effusion, and soften- ing of mucous coat of stomach, Peritoneal adhesion, pus between rectum and uterus, and in right knee, - - - - }	Archives, vol. 19, p. 6.
Mary Banks,	40	f.	Bled for peritonitis,	cephalic,	3d,	fatal on 9th,	Thick, contracted, and containing pus,	{ Pus in right knee, both ankles, and under fascia at elbow joint, - }	Dr Balfour's Probat. Essay.
Helen Bonelly,	32	f.	Bled for abdom. sympt.	median basilic,	2d,	fatal on 7th,	Inflamed, and containing pus,	Right knee filled with pus, - -	Dr Balfour's Essay.
Mary Torrance,	18	f.	Bled, - - -	median basilic,	7th or 8th,	fatal on 18th,	Apparently healthy, - - -	{ Pus in right knee, both ankles, and under fascia at elbow joint, - }	Dr Balfour's Essay.
Sophia Brancher,	25	f.	Bled for an accident,	median basilic,	2d,	fatal on 17th,	Inflamed, and containing pus,	Purulent deposit in knee, - -	Lond. Med. Chirur. Trans. vol. 15.
John Carr,	47	m.	Bled for a strain,	median basilic,	2d,	fatal on 30th,	Impervious, - - - -	{ Purulent deposits in lungs, pleuritic adhesions, serum in ventricles, }	Med. Chirur. Trans. vol. 15.
Captain L.	34	m.	Bled after lithotomy,	median basilic,	2d,	fatal on 21st,	Thickened, and filled with pus,	- - - - -	Med. Chirur. Trans. vol. 14.
Henry Arnold,	51	m.	Bled for an ulcer,	median basilic,	3d,	fatal on 16th,	Thickened, and con. pus and coagula,	{ Serum in ventricles, pus in knee, vasti, and crurales, infiltrated with pus, - - - - }	Med. Chirur. Trans. vol. 15.
Gasper Goldinge,	22	m.	Bled for epilepsy,	median basilic,	2d,	fatal on 7th,	Thickened, and containing pus,	{ Pus in pectoral muscle, pleurisy and pneumonia, serum in ven- tricles, - - - - }	Journal de Medicine, tom. 12.
Clementine,	20	f.	Bled at 6th month,	median basilic,	3d,	fatal on 14th,	Obliterated branches containing pus,	Pleuritic effusion, - - - -	Archives Generales, vol. 19.
Thomas Fuller,	21	m.	Bled for anasarca,	median basilic,	3d,	fatal on 6th,	Thickened, and coated with lymph,	Pleuritic effusion and pneumonia,	Lond. Med. Gazette, vol. 11.
H. A. Porter,	51	m.	Bled for an ulcer,	cephalic,	3d,	fatal on 8th,	Thickened, and con. pus and coagula,	{ Arachnoid thick and opaque, serum in ventricles, pus in knee, and vasti and crurales muscles, - }	Med. Chirur. Trans. vol. 14.
A dissipated wife,	25	f.	Bled for an accident,	median basilic,	5th,	fatal on 14th,	Inflamed, - - - -	Abscess at elbow, and pus in knee,	Med. Chirur. Trans. vol. 14.
John Cruts,	30	m.	Amputation of thigh,	{ femoral ext.- iliac, and cava, }	3d,	fatal on 6th,	Tied, and containing flakes of lymph,	- - - - -	Cooper's Surgical Essays.
- - -	76	f.	Amputation of fore-arm,	radial and ulnar,	12th,	fatal on 20th,	Inflamed, containing pus and lymph,	{ Purulent deposits in lungs, pus in interstices of muscles, &c. }	Archives Generales, vol. 19.
Frederick Wells,	25	m.	Amputation of leg,	femoral,	2d,	fatal on 9th,	Containing pus and lymph,	- - - - -	Lond. Med. Gazette, vol. 11.
Elizabeth Mitchell,	40	f.	{ compd. dislocation of ankle, leg amputated }	tibial,	5th,	fatal on 14th,	Inflamed and very vascular,	- - - - -	Trans. of King's and Queen's Coll. v. 11.
An elderly woman,	-	f.	Operated on for varix,	saphena,	2d or 3d,	fatal,	Abscesses along the course of vein,	- - - - -	Cooper's Surgical Essays.
A dissipated man,	-	m.	Operated on for varix,	saphena,	3d,	fatal,	Much inflamed,	- - - - -	Cooper's Surgical Essays.
John Dodging,	35	m.	Excision of varicose vein,	saphena,	2d,	fatal on 9th,	{ Inflamed, and partly plugged with lymph, also containing pus, }	{ Purulent deposit in lungs, deep seat- ed abscess under fascia of arm and leg, lymph round optic nerves, }	Lond. Med. Gazette, vol. 11.
- - -	23	m.	Vein tied for varix,	saphena,	3d,	fatal on 12th,	Containing pus,	- - - - -	Cooper's Surgical Essays.
A young man,	-	m.	Vein tied for varix,	saphena,	3d or 4th,	fatal in 2d month,	Inflamed and containing pus,	Abscess along the course of the vein,	Cooper's Surgical Essays.

NO.	NAME.	AGE.	SEX.	CAUSE OF DISEASE.	SEAT.	TIME OF INVASION.	DURATION AND TERMINATION.	MORBID APPEARANCES IN THE VEINS.	MORBID APPEARANCES IN OTHER ORGANS.	REFERENCES OF CASES.
35	A middle-aged man,	—	m.	Excision of varicose vein,	saphena,	on 2d day,	fatal on 4th,	Inflamed, vascular, & containing lymph,	—	Hodgson on Diseases of Art. and Veins.
36	A stout man,	—	m.	Vein tied for varix,	saphena,	2d or 3d,	fatal on 9th,	Inflamed,	—	Trans. of King's and Queen's Coll. v. 11.
37	James Boyle,	40	m.	{ Vein wounded in operation for aneurism,	popliteal,	6th,	fatal on 13th,	Containing pus and lymph,	Abscesses on shoulders, hips, and breast,	Trans. of King's and Queen's Coll. v. 11.
38	John Hoey,	—	m.	Vein cut for varix,	saphena,	2d,	recovered,	Vein discharged serum,	Saphena containing pus,	Trans. of King's and Queen's Coll. v. 11.
39	-	23	m.	Operation for varix,	saphena,	6th,	fatal on 22d,	Containing pus,	—	Trans. of King's and Queen's Coll. v. 11.
40	-	—	m.	Operation for varix,	saphena,	2d or 3d,	fatal on 60th,	Abscesses along the veins,	—	Ed. Med. and Surg. Jour. vol. 5.
41	Sophia Walker,	16	f.	Commen. spontaneously,	left iliac,	—	fatal on 30th,	Vein obliterated and containing coagula,	—	Ed. Med. and Surg. Jour. vol. 5.
42	Flicotean,	25	m.	Spontaneous,	tibial veins,	—	fatal on 15th,	Enlarged, and containing pus,	{ Abscess under pectoralis major and between pleura and top of lung, serum in ventricles of brain, intestines inflamed,	Infirmary Journal.
43	-	32	m.	Spontaneous,	{ vena cava inf., iliac, crural and anter. tibial,	—	fatal,	Containing pus, coagula, and fibrine,	—	Archives Generales, vol. 19.
44	A German,	25	m.	Spontaneous,	femoral,	—	fatal on 5th,	Inflamed,	Pneumonia, and abscess of lungs,	Archives Generales, vol. 19.
45	A commissary,	27	m.	Spontaneous,	{ humeral, and several others,	—	fatal on 5th,	Containing pus,	{ A number of subcutaneous abscesses, abscesses in lungs and muscles of limbs,	Archives Generales, vol. 19.
46	-	25	m.	Spontaneous,	{ vena portæ and abdominal veins,	—	fatal on 30th,	Abdominal veins containing pus,	{ Numerous purulent pustules on the body, abscesses in lungs, mucous coat of stomach inflamed,	Archives Generales, vol. 19.
47	A phthisical patient,	26	m.	Spontaneous,	left iliac, & femoral,	—	fatal on 10th,	Inflamed, containing clots and fibrine,	—	Archives Generales, vol. 19.
48	John White,	28	m.	Operation for aneurism,	left femoral,	11th,	fatal on 32d,	Inflamed, thickened, & slightly adherent,	Pleuritic effusion and pneumonia,	Cooper's Surgical Essays.
49	Jane Strangemore,	—	f.	Amputation of leg,	femoral,	2d,	fatal on 29th,	Inflamed, containing lymph, blood, & pus,	{ Inflammation extended to vena cava, down the other iliac vein to the pelvis, and down the femoral to the foot,	Med. and Phys. Journ. vol. 56.
50	Mary McGregor,	58	f.	{ excision of cancerous tumour in axilla,	small veins in axilla,	2d,	fatal on 8th,	Thickened and inflamed,	Parietes of cavity sloughing,	Med. Chirur. Trans. vol. 15.
51	-	—	m.	{ Lateral operation for lithotomy,	crural,	6th,	fatal on 15th,	Containing coagula,	Pus in posterior tibial,	Archives Generales, vol. 21.
52	A mason,	25	m.	{ Injury of the spine from a fall,	renal,	—	fatal on 7th,	Inflamed and containing pus,	{ Pleuritis, abscesses in lungs, also in kidney mucous coat of stomach inflamed,	Archives Generales, vol. 19.
53	-	35	m.	Compound frac. of leg,	femoral,	10th,	fatal on 22d,	Inflamed and containing pus,	Pleuritis, and abscesses in lungs and liver,	Dr Balfour's Essay.
54	-	36	f.	Delivery,	{ veins of uterus & round ligament,	9th,	fatal on 25th,	Containing pus,	{ Pleuritic effusion, and abscesses in lungs and spleen,	Archives Generales, vol. 18.
55	Mrs C.	—	f.	Delivery,	ext. iliac,	10th,	fatal in 6th week,	Thick., contracted, and lined with lymph,	Peritoneal adhesions,	Med. Chirur. Trans. vol. 12.
56	Caroline Dunn,	21	f.	Delivery,	{ femoral ext. and int. iliacs, femoral iliacs,	6th,	fatal on 25th,	Thickened, and containing coagula,	—	Med. Chirur. Trans. vol. 12.
57	Jane Elliot,	—	f.	Delivery,	{ and vena cava,	—	fatal on 34th,	Inflamed, and containing coagula,	—	Med. Chirur. Trans. vol. 12.
58	Mrs L.	—	f.	Delivery,	iliac,	7th,	fatal on 21st,	Inflamed, and almost obliterated,	Pleuritic effusion,	Med. Chirur. Trans. vol. 12.
59	An unmarried woman,	30	f.	Delivery,	femoral,	4th,	recovered,	—	Usual symptoms of phlegmasia dolens,	Med. Chirur. Trans. vol. 12.
60	A weaver,	22	f.	Delivery,	uterine,	4th or 5th,	fatal on 19th,	Filled with pus,	{ Serum in ventricles, mucous coat of stomach inflamed,	Archives Generales, vol. 18.
61	A young woman,	—	f.	Delivery,	uterine and pelvic,	—	fatal in 3d month,	Filled with pus,	Pneumonia,	Archives Generales, vol. 18.
62	A delicate girl,	25	f.	Delivery,	uterine,	4th,	fatal on 15th,	Filled with pus,	Uterus large and very soft,	Archives Generales, vol. 18.
63	A seamstress,	25	f.	Delivery,	{ uterine, and right ovarian,	8th,	fatal on 19th,	Filled with pus,	{ Pus in joints, at wrist, and at symphysis pubis,	Archives Generales, vol. 18.
64	-	31	f.	Delivery,	{ uterine, ovarian & hypogastric,	9th,	fatal on 18th,	Filled with pus,	{ Abscesses in lungs, pus in cavity of pleura, spleen soft,	Archives Generales, vol. 18.
65	A lace-maker,	36	f.	Delivery,	{ uterine, ovarian & hypogastric,	9th,	fatal in 3d month,	Filled with pus,	Pleuritic effusion,	Archives Generales, vol. 18.
66	A seamstress,	22	f.	Delivery,	{ left uterine, and ovarian,	9th,	fatal on 18th,	Filled with pus and coagula,	Pleuritic and perit. effusion and jaundice,	Archives Generales, vol. 18.
67	A stout girl,	27	f.	Delivery,	uterine,	2d,	fatal on 29th,	Filled with pus,	Abscesses in lungs and peritonitis,	Archives Generales, vol. 18.
68	A workwoman,	23	f.	Delivery,	{ uterine, ovarian & hypogastric,	in a few days,	fatal in 4th month,	Enlarged and containing pus,	Abscesses in lungs, stomach red,	Archives Generales, vol. 18.
69	A gentleman,	60	m.	Cold and fatigue,	femoral,	—	recovered,	Thickened, and probably obliterated,	—	See page 15 for details of these two.
70	A gentleman,	22	m.	Subsequent to fever,	femoral,	—	recovered,	Thickened, and probably obliterated,	—	

